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*Observations on the MAGNETIC FLUID. By Captain
O'BRIEN DRURY, of the Royal Navy. Communicated
by Colonel VALLANCEY, M. R. I. A.*

THE magnetic fluid and its phænomena are not less singular than obscure, and have too long engaged the attention of philosophers for me to offer an hypothesis on the subject; I mean only to speak to a matter of fact, which I am led to believe may be serviceable to *navigation*, especially should the variation of the compass ever be made use of as a method for ascertaining the longitude.

Read Nov.
29, 1788.

It is not necessary to enter into a detail of experiments to prove the existence of the *magnetic fluid*, which circulates continually around and through a *magnet*, as it is fully demonstrated by the arrangement of iron filings thrown on glass, placed over a magnet.

EXPERIENCE shews us that the needle of a compass, as well as all other magnets, whether artificial or real, perpetually loses something of its magnetic power, which often produces a difference exceeding a *point*; and I am well convinced that the *great errors in ship-reckonings* proceed more frequently from the incorrectness of the compass than from any other cause.

STEEL

STEEL cannot be too highly tempered for the needle of a sea-compass, as the more it is hardened the more permanent is the *magnetism* it receives; but, to preserve the magnetism and consequently the *polarity* of the needle, I recommend to have the needle cased with thin, well-polished, soft iron, or else to have it armed at the poles with a bit of soft iron.

I HAVE found, from many experiments, that the *cased needle* preserved its magnetism in a much more perfect degree than the needle not cased; and I have sometimes thought that the magnetic power of the cased needle had encreased, and the magnetic power of the uncased and unarmed needle always loses of its polarity.

SOME time ago I placed a *cased needle*, an *armed needle*, and one *without* either case or armour, in a room, for three months, having at that time precisely the same direction, and nearly the same degree of force. At the expiration of the three months I found that the cased needle and the armed needle had not in the least changed their direction; but the other had changed *two degrees*, and had lost very considerably of its magnetic power: If there were any changes in the other needles, it was too inconsiderable to be perceived.

THESE observations appear to me to be new, and may tend to great improvement in our sea-compass: They are here submitted to the consideration of philosophers.

Cove of Cork, 14th April, 1788.